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CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

CONFIDENTIAL

REPORT
CD NO

COUNTRY USSR

DATE OF
INFORMATION 1948

SUBJECT Mining machinery

HOW
PUBLISHED Monthly periodical

DATE DIST. 10 Dec 1948

WHERE
PUBLISHED Moscow, USSR

NO. OF PAGES 3

DATE
PUBLISHED January 1948

SUPPLEMENT TO

LANGUAGE Russian

THIS IS UNEVALUATED INFORMATION FOR THE RESEARCH USE OF TRAINED INTELLIGENCE ANALYSTS

SOURCE IDENTIFICATION Mekhanizatsiya Trudoyemkikh i Tyazhelykh Rabot, No 1, 1948
(FDB Per Abs 62T90 -- Translation specifically requested.)

/SUMMARY/

BASIC PROBLEMS IN THE DEVELOPMENT OF MINING MACHINERY

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In order to complete the program of the new Five-Year Plan, it will be necessary to develop new mining machinery and modernize existing machines along the newest technological lines. For coal mining alone, it will be necessary to establish 33 new machine plants and to rebuild and re-equip 16 others. There are also a great many organizational and technical difficulties that must be overcome in the mining equipment industry; these shortcomings are holding up the production of new machines. Special problems pertaining to the mining industry must be solved.

All available metallurgical developments should be applied to produce machines that are light in weight yet very durable. The machines should be powerful and wear resisting. Mining machinery should be protected from the effects of water in the mines as well as from dust. The shielding materials should be resistant to chemical action. Rust-resistant irons and steels should receive special consideration. The machines must be safe to operate. Materials ordinarily used in machine construction should be supplanted by forged and modified irons, alloys of light metals, etc. The machines should also be protected against dust formation by sprinkler or dust-eliminating systems. The most modern insulating materials should be used in them to protect the workers from electric charges. The component parts of the machine should be easily dismountable to make replacement easier in case of breakage. The machines should be constructed with the maximum use of standard and conventional parts.

Mining machinery construction, due to the peculiarity of the demands made on the equipment, is a special branch of the machine-construction industry. There should be theoretical, experimental, and practical bases for this type of construction. The national industry has achieved significant success. Plants in the east are preparing all types of mining equipment, while the western plants(at Gorlovka, Toretsk, Stalinsk, Vorishilovgrad,

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Kharkov, and others) are rapidly being rebuilt or have been completed.

According to our opinion, some of the basic and principal problems of the machine construction are:

1. Speed-up in release of new types of mining machinery. One reason for the delay is the lack of experimental shops; of nine plants of the Ministry of the Coal Industry of the Eastern Regions, only one has an experimental shop.

2. Increasing the quality of mining machinery. The Technical Council for Mechanization of Labor-Consuming and Heavy Work of the Council of Ministers USSR, in testing mining machinery found many defects in construction, obsolete methods, lack of standardization in the plants, and errors in selecting materials and tolerances. Several new machines such as the SEM-3 and KM-4, have been constructed since the war.

3. Creation of machines for currently nonmechanized operations such as loading coal, rocks, and ores, and organization of the manufacture of a series of machines and equipment for open-pit (strip) mining. The latter industry is not even prepared at present to repair existing equipment. Research and construction institutes must be organized, as well as plants for open-pit mining.

4. Improving the quality of mining machinery by improving the industrial technology, such as introducing special machines like automatic welders, which was done at the Toretsk Plant imeni Voroshilov and Kiselevsk Plant. The improvement of the obsolete equipment and use of modern technological processes was begun only recently.

5. Plant specialization, which can eliminate many of the above-mentioned problems.

6. The use of high-stability materials and light alloys such as nickel-molybdenum and nickel-chrome steels to assure high stability.

Along with the technical problems listed above, attention must be paid to a great many organizational shortcomings which will require less time and expense to eliminate. Some of these are:

1. Control of the quality and instrument testing of machines. This was only begun by the Giprouglemash in ventilation and by the Moscow Mining Institute on ore conveyor machines. Workers' qualifications should be raised and a system of plant inspectors established.

2. Proper distribution of construction operations between the central construction organizations and the secondary plants. The work of the various constructors should be closely defined.

3. Much wider application of new materials in the present construction practice.

4. Active participation of other Ministries in the creation of modern mining machinery, such as the Electrical, Ball Bearing, and others.

5. Require the construction departments of the Ministries which are preparing mining machinery to modernize and develop new mining equipment.

6. Training of personnel in mining-machine construction to make specialization easier by preparing texts, charts and other educational means.

7. Eliminate parallel operations in plants and construction organizations. Elimination of decentralizing influences, such as the existing two Ministries of Coal and of Fuels. The publication of a special journal for this field might be of great assistance.

8. Exchange of machines. In many cases ministries retain equipment which they no longer need, while other ministries are planning their construction.

9. Creation of a coordination center for mining-machine construction, where information could be furnished on all phases of the industry and equipment. It could be a clearinghouse for various problems, such as the names of the 200-odd machines of various ministries in this field.

10. The calling of a conference on mining machine construction, which would help bring the problems into the open. Some of the problems which might be considered are:

a. Machine construction for the mechanization of individual processes in the mining industry.

b. Coordination of research and experimental work in mining machine construction.

c. Organization of information and its exchange.

d. The construction technology of mining machinery.

e. Exchange of reports in the organization of continuous mass production.

f. Introduction of high-productivity machines.

g. Standardization of mining machine construction.

h. Organization of technical aid to introduce the new technology.

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